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Brooks Kushman P.C. 1000 Town Center, Twenty-Second Floor Southfield, MI 48075-1238			MARKS, JACOB B	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DAVID KISAILUS, THOMAS B. STANFORD,
TINA T. SALGUERO, and JENNIFER J. ZINCK

Appeal 2011-010457
Application 11/563,372
Technology Center 1700

Before BRADLEY R. GARRIS, BEVERLY A. FRANKLIN, and
GRACE KARAFFA OBERMANN, *Administrative Patent Judges*.

OBERMANN, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants seek relief pursuant to 35 U.S.C. § 134 from the Examiner's rejection under 35 U.S.C. § 103(a) of claims 19, 21-26, 28-33, and 35-36 as unpatentable over Bett (US 5,840,414, patented Nov. 24, 1998) in view of Eddy (US 7,037,617 B2, patented May 2, 2006) and Hennige (US 2004/0038105 A1, pub. Feb. 26, 2004). We have jurisdiction under 35 U.S.C. § 6.

We AFFIRM.

Claims 19 and 30, the only independent claims, both require a bipolar plate coated with a modified metal oxide having “a plurality of acid

residues” on one or more surfaces. Our analysis of claim 19 disposes of all issues raised in this appeal. Claim 19 reads as follows:

19. A bipolar plate for fuel cell assemblies, the bipolar plate comprising:

a metallic substrate having a first and second surface, the first surface defining one or more first surface channels; and

a modified metal oxide coating disposed over at least a portion of the first surface such that a portion of first surface defining the one or more first channels is coated with the modified oxide coating, the modified metal oxide coating having a predetermined contact angle and a plurality of acid residues.

A metal oxide coating may be formed by placing a clean metallic substrate in a metal chloride solution and heating to 200° C for 18 hours. Spec. ¶ [0030]. The coating thus formed is modified according to the invention by immersing the coated metallic plate in an acid bath comprising, for example, hydrofluoric acid, *id.*, which leaves “a plurality of acid residues” on the surface of the coating. *Id.* at ¶ [0022]. The acid residues affect the contact angle and, thus, the hydrophilicity of the modified metal oxide coating. *Id.* at ¶ [0006].

Bett discloses a method of forming a metal oxide coating on a porous graphite plate wherein the plate is immersed in a metal chloride solution for one hour under vacuum followed by an additional hour at atmospheric pressure to allow the solution to fill the pores. Bett 5:55-6:6. The plate is then removed from the metal chloride solution and immersed in an aqueous solution of base (ammonia) under conditions that convert the metal chloride to an insoluble metal hydroxide, which is then calcined to form a metal

oxide. Bett 6:6-18. Appellants do not challenge that it would have been obvious to substitute Eddy's metallic plate for the porous graphite plate in Bett's method. Ans. 4; App. Br. 3-6.

The nub of Appellants' argument is that the applied art fails to suggest "a plurality of acid residues" on the surface of a metal oxide coating. App. Br. 3-6. The Examiner concedes that Bett's method, which involves a basic catalyst, produces "a plurality of base residues" on the coating, rather than "a plurality of acid residues" as specified in claim 19. Ans. 4 (citing Bett 5:44-6:17). The Examiner thus turns to Hennige for a teaching that base and acid were recognized interchangeable alternatives for catalyzing the hydrolysis of metal chloride to metal hydroxide. *Id.* (citing Hennige ¶ 52). The Examiner finds, and Appellants do not contest, that substituting an acid for the base in Bett's method "would inherently leave a plurality of acid residues" on the surface of Bett's metal oxide coating. *Id.*; *see* App. Br. 3-6.

Appellants challenge the Examiner's reliance on Hennige, which involves a process for making a sol coating precursor rather than a coating. App. Br. 5. The Examiner responds that metal chloride is converted to metal hydroxide in Hennige's sol coating precursor via the same chemical reaction (hydrolysis) by which metal chloride is converted to metal hydroxide on the surface of Bett's graphite plate: Thus, in the Examiner's view, Hennige's teaching that acid and base serve an identical catalytic function in the hydrolysis reaction applies with equal force to Bett's method. Ans. 10-11. Appellants do not challenge that premise. Reply Br. 1.

Appellants point out that the claimed invention relates to treating a metal oxide coating to produce acid residues and not to a hydrolysis

reaction. App. Br. 5. The Examiner responds that Appellants' written description does not limit "the type of chemical reaction" useful for producing acid residues on the surface of a metal oxide coating and, further, finds that Bett's hydrolysis reaction, modified to substitute an acid for the base catalyst, is one type of surface treatment that yields such a coating.

Ans. 10. Appellants raise no challenge to that premise. Reply Br. 1.

Appellants question the Examiner's understanding of the difference between an acid, which "will leave behind hydrogen ions that protonate the oxygen atoms resulting in hydroxyl groups (-OH) being formed," and a base, which "leaves behind negatively charged oxygen groups (-O)." Reply Br. 1. In Appellants' view, the Examiner errs in "an analysis that basically states that acid residues are the same as basic residues." App. Br. 3. On this point, Appellants come forward with evidence that "contacting a surface with a base will not produce a surface with acid residues." Winter Decl. ¶ 5.

Appellants' argument is unconvincing because it misapprehends the gravamen of the rejection. The Examiner makes clear that Bett's reaction using a base "is not offered as teaching the acid residue limitation." Ans. 9. The Examiner offers Hennige to show that a skilled artisan would have recognized that Bett's reaction "can be catalyzed in either a base or an acid." *Id.* On that basis, the Examiner concludes that it would have been prima facie obvious to substitute an acid for the base in Bett's reaction. *Id.* at 5.

Where two known alternatives are interchangeable for a desired function, an express suggestion to substitute one for the other is not needed to render a substitution obvious. *In re Fout*, 675 F.2d 297, 301 (CCPA 1982); *In re Siebentritt*, 372 F.2d 566, 568 (CCPA 1967). Appellants come

forward with no persuasive argument or evidence refuting the finding that acid and base were recognized interchangeable alternatives for catalyzing Bett's reaction. App. Br. 3-6; Reply Br. 1. Nor do Appellants contest that substituting an acid for the base in Bett's reaction would produce "a plurality of acid residues" on the surface of a metal oxide coating as specified in claim 19. *Id.* On this record, the Examiner prima facie shows that claim 19 is unpatentable over the applied art.

For the above reasons, we affirm the decision of the Examiner.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

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